

## Collecting Cladoniae in Maine and Quebec

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About 175 packets of Cladoniae, several new to the writer, some new to his helpful instructor, Dr. A. W. Evans of Yale University, with whom he shared them, and who confirmed or corrected determinations; and most of them robust and well fruited beyond their conditions of more southern latitudes and lower levels, were collected on a two weeks' trip of the Torrey Botanical Club, July 2-18, 1937.

The first collections were made on Mount Bigelow, near Stratton, in northwestern Maine, one of those fine summits in the western part of the State, which have not been well botanized, and which would probably yield many alpine and boreal species of plants on thorough search. The party climbed to the eastern summit, 4,050 feet, from the Dead River side, following the Maine sector of the Appalachian Trail. This 2,050 mile footpath from Mount Katahdin, Maine, to Mount Oglethorpe, Georgia, is maintained by outdoor clubs of the Atlantic seaboard states, federated in the Appalachian Trail Conference, with headquarters in Washington, D. C.

Cladoniae began to appear plentifully on the ledges near the edge of the timber at about 3,500 feet, on the southeast shoulder. Here were found *C. uncialis*, *rangiferina*, *fimbriata* and *mitis*. On the northeast slope, as the trail neared the summit, among low heaths, such as *Vaccinium vitis-idaea*, var. *minus*, *uliginosum* and *caespitosum*; *Empetrum nigrum*, and the Iceland Moss Lichen, *Cetraria islandica*, were Cladonia associations of more northern character, including *C. amaurocraea*, *C. gracilis*, var. *chordalis*, f. *leucochlora*; *C. deformis*; my old friend of Long Island and the New Jersey Pine Barrens, *C. squamosa*, f. *levicorticata*, m. *rigida*, which I meet from sea level to 5,000 feet; *C. chlorophaea*, f. *simplex*, almost equally ubiquitous; *C. pleurota*, *nemoxyna*, *ochrochlora*, *alpestris*, *rangiferina* and *uncialis*.

On the summit, near the fire observation tower, another old friend of wide latitude and altitude, was *C. cristatella*, ff. *beauvoisii* and *vestita*; with *C. gracilis*, var. *dilatata*, some very small in this exposed spot; *C. bacillaris*, *fimbriata* and *chlorophaea*.

Descending west along the Appalachian Trail, about a

hundred feet below the summit, *C. amaurocraea* was found plentifully and in good condition, in the forms *celotea* and *furcatiformis*, with definite cups, and *oxyclada*, with subulate tips. The range of *C. amaurocraea* seems to be incorrectly given in our most recent American reference, Fink's "Lichen Flora of the United States," which states, on Page 253, that it is found "on soil, throughout the United States." Tuckerman's "North American Lichens," Part I, page 250, states the range better, as "on the earth in alpine districts," although, as will be recorded in this paper later on, I found it at Tadoussac, Quebec, at the mouth of the Saguenay River, only fifty feet above the level of the St. Lawrence. I have found it, or had it from others, in the northeastern states only from high summits in Maine, northern New Hampshire, northern Vermont and the northern Adirondacks. I have not heard of it from the high southern Appalachians, where other northern Cladoniæ found refuge, like other northern plants, in the migrations northward after the last Ice Age. I doubt if it occurs, south of the stations mentioned, in northeastern North America. It becomes common at lower levels in Newfoundland, Labrador and Greenland.

A large and conspicuous Cladonia on this part of the trail was a clump of the long green podetia, some cupped, most of them subulate tipped, of *C. gracilis*, var. *elongata*, f. *esquamosa* (*C. elongata* of some authors), some of them four inches long. *C. rangiferina*, f. *stygia*, the mountain form with the lower parts of the podetia blackened; *C. gracilis*, var. *chordalis*; *C. alpestris*, and *squamosa*, also occurred.

In an old field, growing up with spruce, east of Stratton, were *C. alpestris*, *mitis*, *rangiferina*, and *multiformis*, ff. *finkii* and *subascypha*, the last found within the Torrey Botanical Club range, at moderate altitudes, around 1,200–2,000 feet.

Continuing by automobile through New Brunswick, to Gaspé, and from New Richmond up the old mine road along the Grand Cascapedia River, we left our cars at the Federal Lead and Zinc Mine, and took to our feet, our tents and duffle being toted in a wagon over the road past Lake St. Anne to our camp at the headwaters of the Madeleine River, south of Table Top, our principal objective on the trip. Climbing to the plateau, next day, we explored Mount Richardson, 4,150 feet, the highest knob on the southwestern corner of this large

nunatak area, refuge of a Tertiary flora above the last ice sheets.

Here one of the interesting finds, as also at Tadoussac, a few days later, was a *Cladonia* which looked like *alpestris*, but on which Dr. Evans reported as follows:

"These certainly look like *C. alpestris*, but give a distinct reaction with P, [paraphenylenediamine] much more pronounced than the pale yellowish color obtained with *C. pycnoclada* [a species also resembling *alpestris*, which I have been seeking for Dr. Evans]. Dr. Sandstede has recently sent me an antarctic specimen collected by Harriot in the Magellan region. This was determined by Vainio as *C. pycnoclada*, f. *flavida* (Mon. 1: 39). It gives, however, a distinct reaction with P and, according to Dr. Sandstede, has a bitter taste. He states that it ought to be separated out as a distinct species. Your specimens are more compact than the antarctic material, and I should hesitate to pronounce them the same. I have sent samples of both your plants to Dr. Sandstede and am anxious to hear what he has to say about them."

Another odd one looked like *C. crispata*, but was P yellow, unlike the reaction of that species. It has also gone to Dr. Sandstede. *C. crispata*, var. *virgata*, which is quite northern, was present; also a form new to me, f. *kairamoi*, more densely clustered and squamulose, *virgata* being smooth. *C. amaurocraea* was frequent, in the forms *oxyclada* and *furcatiformis*, and one, covered with galls, indistinguishable as to form. Other *Cladoniae* were *C. rangiferina*, f. *stygia*; *pleurota*, *gracilis*, var. *chordalis*; *squamosa*, *digitata*, *carneola*, *uncialis* and *mitis*.

On our departure from the high Shickshocks, we climbed over the bare summits of Mount Sterling, which, though only 3,150 feet, has much surface above timber, in loose slides, of unglaciated rock, and which gives magnificent views of Table Top, Mount Albert with its snow fields, and the gorge of the St. Anne River. On the summit were *C. amaurocraea*, ff. *furcatiformis* and *oxyclada*; *coccifera*, var. *stemmatina*; *gracilis*, var. *chordalis*; *uncialis*, *squamosa*, and *crispata*, var. *virgata*.

Descending one of the slides to the wagon road, handsome scarlet fruited *C. pleurota*, with crowded, red-tipped stipes around the rims of the cups, was frequent; also more *C. amaurocraea*, ff. *furcatiformis*, and *oxyclada*; *C. gracilis*, var. *elongata*,

f. *esquamosa*; *C. squamosa*, *uncialis*, *carneola* and my wide-flung friend of early lichen hunting, *C. cristatella*, ff. *beauvoisii* and *vestita*.

Along the wagon road were found *C. gracilis*, var. *dilatata*; *C. cenotea*, f. *crossota*; *C. chlorophaea*, f. *simplex*; *C. mitis*, and *C. crispata*, var. *virgata*.

A low granite knob, between the two steamboat landings at Tadoussac, where we awaited the boat up the Saguenay River, disclosed some interesting things in a couple of hours' collecting. Here was plenty of *C. amaurocraea*, in forms previously known to me and found earlier on this trip, ff. *furcatiformis*, and *oxyclada*; but also a new one, f. *fasciculata*, a puzzling one, with densely fascicled clumps, looking like *C. uncialis*, but with cups and rather large brown apothecia, thus unlike any form of *uncialis*; and with a cracked cortex and cottony medulla showing through. Also here was the species I thought *alpestris*, but which Dr. Evans thought possibly *pyncoclada*, subject to Dr. Sandstede's opinion. *C. gracilis*, var. *chordalis*; *C. mitis*, *tenuis*, *bacillaris* and *squamosa* were also present. The richness of this association suggests that this part of the north shore of the St. Lawrence, from Tadoussac along the new road only recently opened into a sparsely settled country eastward to Port Neuf, would be worth exploring intensively on another trip.

Turning southward across the Laurentides National Park, a rough plateau, from 1,500 to 3,000 feet, I found many places which appeared to have been burned years ago and were now returning in scattered spruce and fir, with much bare, tundra-like surface, richly covered with robust *Cladoniae*. *C. crispata*, var. *virgata* was very common, more than I ever saw elsewhere. *Cladonia deformis* was also frequent and of large size. Others, at a station near the Upika River, were: *C. mitis*, *rangiferina*, *alpestris*; *gracilis*, var. *chordalis*; *cornuta*, ff. *cylindrica* and *scyphosa* (which is also common along the mine road along the Cascapedia in Gaspé), and *uncialis*.

Farther south, on Route 54, to Quebec, at Porte de L'Enfer (Hell Gate), where the Jacques Cartier River gathers between high ridges, open, once badly burned spaces among the conifers were covered with dense carpets of *Cladoniae*, in which *C. crispata*, var. *virgata* was often dominant; also f. *dilacerata*; *C. gracilis*, var. *chordalis*; *C. uncialis*, *rangiferina*, *mitis*, f. *tenuis*;

*alpestris*, large, but weathered and twisted *C. deformis*; *cenotea*, f. *crossota*; *pleurota*, *carneola*, f. *simplex*; *C. cristatella*, f. *beauvoisii*; and *C. gracilis*, var. *chordalis*, f. *leucochlora*, new to me, with heavily squamulose podetia, and more *C. crispata*, var. *virgata*, everywhere one looked.

This was all very satisfactory collecting, but I hope to make more such trips into Quebec. The northern and higher end of Table Top ought to be good; the coast east of Tadoussac, and some of the higher ridges in the Laurentides National Forest, which would not be hard to reach from Route 54, which climbs straight over many of them, at altitudes up to 3,000 feet, so that one would only have to step out of his car and climb a few hundred feet to the highest points in this scenic region. It would be still better, no doubt, if we could follow all the way in the footsteps of André Michaux, up the Saguenay, across Lake St. Jean, up the Mistanissi and Peribonka waters, to the height of land and to the great Lake Mistanissi, emptying into James Bay, which the French botanist-explorer, the first scientist to see it, beheld 142 years ago.

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